



## Stat/Biostat550 2016

### Syllabus

#### Stat/Biostat 550 Syllabus: Spring 2016

Statistical Genetics I; Discrete Mendelian Traits  
MWF 8:30-9:20, THO 202

#### Instructor

Sharon Browning, Department of Biostatistics

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#### Class website

<https://catalyst.uw.edu/workspace/sguy/53367/>

#### Textbooks

E. A. Thompson, Statistical Inference from Genetic Data on Pedigrees. IMS/ASA. 2000. <http://www.jstor.org/stable/4153187> (access provided through UW).

#### What this course is about

Description from course catalog: *Mendelian genetic traits. Population genetics; Hardy-Weinberg, allelic variation, subdivision. Likelihood inference, information and power; latent variables and EM algorithm. Pedigree relationships and gene identity. Meiosis and recombination. Linkage detection. Multipoint linkage analysis.*

Genetic variants, such as single nucleotide polymorphisms, are discrete Mendelian traits. We will study the behavior of genetic variants in populations and in families, and linkage analysis, which is a method for determining which region of the genome harbors a Mendelian trait of interest.

This course is a prerequisite for Stat/Biostat 551 (Statistical Genetics II; Quantitative Traits) and Stat/Biostat 552 (Statistical Genetics III; Design and Analysis).

#### Grading

25% homework, 25% computing labs, 20% participation/reading, 30% final project.

There is no final exam. The final project will be due at 11am on Wednesday of finals week (June 8).

#### Computing

We will use software that should be able to run on PCs, Macs, or Unix computers. We will use some specialized software, including PLINK <https://www.cog-genomics.org/plink2/> and Beagle <http://faculty.washington.edu/browning/beagle/beagle.html>, as well as R. We will work through the computing parts of the labs during class times.

#### Participation/Reading

In order to make class times productive and interactive, we will all need to read the assigned material before class. If you have trouble with the assigned reading, you should look for other relevant resources online. Please add at least one comment or question relating to the reading to the online forum for each day that has assigned reading, before class.

## Homework

Homework and computing labs will be collected during class on the assigned dates. Homework and labs should be turned in on paper, unless you can't make it to class due to illness. We will make time in class to discuss the difficult aspects of homework in the days before the homework is due. Start your homework early so that you can make best use of the in-class interactions.

## Final Project

The final project is a literature project. Choose a suitable paper from the literature which extends or provides additional background on the material of the course. A list of good papers is provided, but you are not limited to this list. Write a report, summarizing the paper, its objectives, its results, and how it fits into the broader picture. More details are provided on the Project page of the catalyst website.